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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
JOHNSTON, PHILLIP A	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 05/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,262	ADLER ET AL.	
	Examiner	Art Unit	
	Phillip A Johnston	2881	

-- The MAILING DATE f this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *48-51,53-56,61,62 and 66-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *48-51,53-56,61,62 and 66-69* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

1. This Office Action is submitted in response to Amendment dated 3-22-2004, wherein claim 52 is cancelled, claims 48 and 53 are amended, and Claims 48-51,53-56,61,62, and 66-69 are pending.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 48-51,53-56,61,62, and 66-69 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,465,781 to Nishimura, in view of Larson U.S. Patent No. 5,444,242, and in further view of Ose, U.S. Patent Pub. No. 2001/0010357.

Nishimura (781) discloses in FIG. 1 an electron beam apparatus 10 that includes in the vacuum interior of a barrel 2 an electron beam source 11 having an electron gun which emits an electron beam, a condenser lens and a drawing electrode, a blanking mechanism 17 which turns on and off the projection of electron beam, a deflecting device 12 which deflects the electron beam, an electromagnetic lens 13 which focuses

the electron beam on a sample 16, and an electron detector 14 for detecting electrons, e.g., secondary electrons or reflected electrons released from the sample 16, and further includes inside a vacuum chamber 3 an x/y table 15 on which is mounted a sample stage 21 for placing the sample 16, a position measuring device (not shown) for measuring the position of the x/y table 15 accurately, a grid electrode 24 disposed near the sample 16, and a height measuring device 19 for measuring the height of the sample 16.

The barrel 2 of the electron beam apparatus 10 further incorporates a UV light projection system 30 which projects a UV light into the barrel 2 for the purpose of preventing the contamination and charge-up of the barrel interior, and a UV light source 31 which irradiates the sample 16 with a UV light during the scanning of the electron beam thereby to discharge the sample 16 (to maintain surface charge, as recited in Claims 48,55,61,66, and 69).

The UV light source 31 can be an excimer lamp which is designed to irradiate the insulation film on the sample 16 of semiconductor substrate or the like with a UV light of 150 nm or less thereby to energize electrons in the valence band (filled band) in the insulation film to shift to the conduction band so that the electrons contribute to the electrical conduction (electronic conduction), thereby causing charges on the insulation film to flow out to the sample stage 21 having the application of a negative voltage (again, to maintain surface charge, as recited in Claims 48,55,61, 66, and 69). See Column 5, line 29-67; and Column 6, line 1-15.

Nishimura (781) also discloses a beam source potential adjusting device 9 adjusts the potential of the electron beam source 11 in accordance with the potential adjusting command from the general controller 8. A grid potential adjusting device 25 adjusts the potential of the grid electrode 24, which is virtually the ground voltage, in accordance with the potential adjusting command from the general controller 8. A sample stage potential adjusting device 22 adjusts the negative potential of the sample stage 21 in accordance with the potential adjusting command from the general controller 8. These beam source potential adjusting device 9, grid potential adjusting device 25 and sample stage potential adjusting device 22 adjust the potential of the electron beam source 11, grid electrode 24 and sample stage 21, respectively, so that the electron beam detecting condition varies, thereby controlling the image quality, such as the contrast, of the produced image.

A stage controller 23 controls the movement of the x/y table 15 based on the positional feedback in accordance with the command from the general controller 8. The electron beam emitted by the electron beam source 11 is converged by the condenser lens (not shown) in the electron beam source 11 and the electromagnetic lens (objective lens) 13 to have a beam diameter comparable with the pixel size on the sample surface and projected in the focused state to the sample surface. At this time, a negative voltage is applied to the sample 16 through the sample stage 21, with the grid electrode 24 being kept at virtually the ground voltage, so that the electron beam is decelerated on the path between the objective lens 13 and the sample 16, thereby enhancing the resolution of image in the low acceleration voltage range (having

sufficiently low energy as recited in Claims 48,55,61, 66, and 69). See Column 6, line 49-67; and Column 7, line 1-12.

Nishimura (781) further discloses that in the case of the dimensional measurement based on electron beam imaging, for example, for an electron image 120 exhibiting a line width W1 shown in FIG. 12 produced in the absence of charge-up, the occurrence of charge-up causes the electron detector 14 to produce an electron image which exhibits a swelled line width W2 as shown in FIG. 13, resulting in a measurement result of an erroneously larger line width W2. In FIG. 12A, FIG. 12B shown by (a) is the electron image 120 in the absence of charge-up, and (b) is the measured line width W1 on the scanning line "a". Similarly, shown by FIG. 13B is the line width W2 on the scanning line "a", which is measured larger erroneously due to charge-up. Different magnification factors at positions due to charge-up, exhibits different line widths W3 and W4, which are actually the same, as shown in FIG. 14.

For coping with this matter, the UV light source 31 is activated to emit an exciting UV light of 150 nm or less to the sample 16, e.g., a semiconductor substrate, so as to cover the observation field of electron beam scanning. In the insulation film of SiO_2 or Si_3N_4 on the sample 16, electrons in the valence band (filled band) are energized to shift to the conduction band so that the electrons contribute to the electrical conduction (electronic conduction), thereby causing charges on the insulation film to flow out to the sample stage 21 having the application of a negative voltage, and the sample 16 is discharged. See Column 14, line 45-67; and Column 15, line 1-3.

Nishimura (781) still further discloses that, the irradiation of UV light 39 of 150 nm or less to the above-mentioned insulation films will create photoelectrons, which will be detected as a noise component by the electron detector 14. On this account, a UV irradiation controller 32 is used so that the UV light 39 (39'), which irradiates the same view field as of the electron beam, does not interfere with the electron beam. Specifically, the UV irradiation controller 32 receives the horizontal scanning signal 151 (particularly the blanking signal included in it) from the scanning controller 18 thereby to produce a UV light irradiation signal 152 as shown in FIG. 15. The signal 152 is used to activate the UV light source 31 during the blanking period or open the shutter means (e.g., a swing mirror) 38 on the UV light path during the blanking period, (the alternately exposed influx of photons and electrons, as recited in Claim 50). See Column 15, line 26-39.

Also, in regard to the UV light source 31, if it necessitates pumping at an interval of 10-50 mμs, for example, and has its emitted UV light intensity varying periodically, as in the case of an A.C. excimer lamp for example, the scanning controller 18 is designed to quit blanking and project the scanning electron beam across the inspection/measurement area on the sample 16 during the period Te of lower UV emission of the UV light source 31 as shown in FIG. 20 informed by the general controller 8 or irradiation controller 23, and operate on the electron detector 14 to produce an electron image in this period, whereby it is possible to produce an electron image which is rid of the influence of photoelectrons created by the UV light irradiation

and relieved of charge-up (the concurrently exposed influx of photons and electrons, as recited in Claim 49). See Column 17, line 5-18.

Although Nishimura (781) exposes the substrate to both low–energy electrons and photons to maintain surface charge on the substrate at a predetermined level, Nishimura (781) does not specifically disclose the selection of both an energy and current density profile of the low-energy electrons to maintain surface charge on the substrate. Larson (242); however, discloses an instrument 10 for analysis of a surface 12 of a sample specimen 14,illustrated schematically in FIG. 1. An electron gun 16 has an appropriate electron lens system 18 for focusing an electron beam 20 onto the surface 22 of a target anode 24. The gun may be a conventional type, modified to optimize for higher power and larger beam size. The electron beam 20 should focus to a spot 26 (FIG. 3) on the anode surface, the spot being as small as practical, e.g. down to about 4 microns. This results in the generation of x-rays 27 from the anode, and in particular from the anode spot.

A Bragg crystal monochromator 34, advantageously single-crystal quartz, is disposed to receive a portion of the x-rays 27 from the anode 24. The monochromator has a crystallographic orientation and a concave configuration 35 to select and focus a beam of x-rays 36 in the desired energy band, e.g. the K-alpha line, as an x-ray spot 38 on the specimen surface 12 to be analyzed. The x-ray spot on the specimen is an image of the anode spot 26. The specimen 14 rests on a stage 40 that may have orthogonal micrometer positioners 42 for manual or motorized positioning with respect to a support 44 in the instrument. See Column 5, line 36-46; and Column 6, line 11-22.

Larson (242) also discloses that the x-rays 36 cause photoelectrons 52 to be emitted from the active, scanning pixel area 48 of the specimen. The electron kinetic energies generally include a low energy peak in the range of up to 10 ev, usually about 2 to 5 ev, plus higher kinetic energy peaks or lines characteristic of chemical species (viz. chemical elements and/or their electron bondings) in the selected pixel area. With the rastering, characteristic higher energy photoelectrons vary with chemistry across the specimen surface, and the low energy electrons (commonly known as "secondary electrons") vary with topography as well. The photoelectron spectrum provides information on the surface at a selected pixel area or across the rastered array of areas. There also may be Auger electrons, which, for the present purpose, are included in the term "photoelectrons" as they are caused by the x-rays.

The scanning x-ray embodiment for topographical imaging or chemical mapping, or for summing of chemical information over the surface, is advantageous for specimens of electrically insulating material because the primary beam is neutral. Photoemission will cause the sample to charge positively and impede further emission, but this positive charging is readily neutralized by flooding the specimen with a with low energy electrons 100 (generally 1-10 eV and 0.1-10 .mu.A) from a flood gun 98 such as a Perkin-Elmer model 04-090 electron gun or the like. The low energy electrons will not be detected through an analyzer for chemical mapping. See Column 6, line 65-68; Column 7, line 1-12; and Column 12, line 1-12.

Therefore it would have been obvious to one of ordinary skill in the art that the imaging apparatus and method of Nishimura (781) can be modified to use low-energy

electrons in accordance with Larson (242), to neutralize the surface charge on the sample due to photelectron emission.

Nishimura (781) in view of Larson (242) as applied above does not disclose the use of filtering to either, (a) select reflected electrons and reject photoelectrons, as recited in Claim 52; (b) select reflected electrons and reject secondary electrons, as recited in Claim 66 ; or (c) select secondary electrons and reject reflected electrons , as recited in Claim 61. However, Ose (357) discloses that device miniaturization has progressively advanced in the semiconductor industry in recent years, and optical microscopes for inspection in semiconductor device fabricating processes and test processes have been replaced by SEMs. The SEM uses an electron beam for dimension measurement and testing electrical operations. When observing an insulating specimen, such as a wafer that is used in the semiconductor industry, is observed with a SEM, a low acceleration voltage of 1 kV or below must be used not to charge the insulating specimen. Generally, the resolution of a general SEM using a low acceleration voltage of 1 kV is about 10 nm. As the miniaturization of semiconductor devices advances, demand for SEMs capable of forming images in a high resolution by using a low acceleration voltage has increased. See Paragraph [0003].

Ose (357) also discloses that the secondary signal electrons 2 are generated when the specimen 13 is irradiated with the primary electron beam 1. The secondary signal electrons 2 include secondary electrons and reflected electrons. The electric field created in a space between the objective 10 and the specimen 13 acts as an

acceleration electric field on the secondary signal electrons 2. Therefore, the secondary signal electrons 2 are attracted to the electron beam-passing aperture of the objective 10. The secondary signal electrons 2 travel upward being subjected to the focusing action of the magnetic field of the objective 10. The secondary signal electrons having high energy collide against a conversion electrode 16, whereby secondary electrons 3 are emitted. A positive high voltage of about 10 kV is applied to a scintillator 17. The scintillator 17 attracts (deflects) the secondary electrons 3 and emits light. A secondary electron detector, not shown, that detects secondary electrons guides the light emitted by the scintillator 17 by a light guide to a photomultiplier, the photomultiplier converts the light into a corresponding electric signal, the electric signal is amplified and the amplified electric signal is used for the brightness modulation of a CRT. See Paragraph [0026]

It is possible to prevent the secondary electrons from passing the central aperture of the conversion electrode 16 by disposing an energy filter 60 including a plurality of layers of meshes below the conversion electrode 16 with respect to the traveling direction of the primary electron beam, whereby energy discriminating ability is improved. In the SEM in this embodiment, a secondary electron detector, not shown, may be interposed between the energy filter 60 and the objective 10 to catch all the secondary electrons that collide against the meshes of the energy filter 60 and do not reach the conversion electrode 16. See Paragraph [0031]

Therefore it would have been obvious to one of ordinary skill in the art that the imaging apparatus and method of Nishimura (781) in view of Larson (242) can be

modified to use the filtering apparatus and method of Ose (357), to improve image resolution and accuracy of dimensional measurement.

Nishimura (781) in view of Larson (242) also does not disclose the use of angular filtering as recited in Claims 56, and 67-69. Ose (357); however, also discloses that when there is not any retarding electric field or the retarding electric field is sufficiently small, only the reflected electrons pass the electron beam passing aperture of the objective 10. The reflected electrons have high energy. Positions at which the reflected electrons fall on the conversion electrode 16 are dependent on angle at which the electrons are reflected by the specimen 13 and energy of the reflected electrons. Therefore, information represented by the selected reflected electrons can be obtained in a high sensitivity by disposing an aperture filter 62 below the conversion electrode 16 with respect to the traveling direction of the primary electron beam. When the reflected electrons reflected in a substantially perpendicular direction are selected, an image of high contrast of a specimen having a specific atomic number can be observed in a high resolution. In the conventional SEM, the path of the reflected electrons and the path of the primary electrons overlap each other and hence the detection of the reflected electrons is difficult. See Paragraph [0032].

Therefore it would have been obvious to one of ordinary skill in the art that the imaging apparatus and method of Nishimura (781) in view of Larson (242) can also be modified to use angular filtering in accordance with Ose (357), to further improve image contrast.

Examiners Response to Arguments

4. Applicant's arguments filed 3-22-2004 have been fully considered but they are not persuasive.

Argument 1.

Applicant states that "Ose et al. is cited for the fIltering it disclosed. However, the fIltering in Ose relates to fIltering to select reflected electrons and reject secondary electrons, both caused by a same incident electron beam. Ose et al. does not disclose the filtering out of photoelectrons caused by a separate beam as required by claim 48 as now amended. Hence, applicants respectfully submit that claim 48, as amended, is now patentably distinguished over the combination of Nishimura et al., Larson et al., and Ose et al. "

The applicant is respectfully directed to Larson (242), Column 6, line 65-68; and Column 3, line 45-67, which states; The x-rays 36 cause photoelectrons 52 to be emitted from the active, scanning pixel area 48 of the specimen. The electron kinetic energies generally include a low energy peak in the range of up to 10 ev, usually about 2 to 5 ev, plus higher kinetic energy peaks or lines characteristic of chemical species (viz. chemical elements and/or their electron bondings) in the selected pixel area. With the rastering, characteristic higher energy photoelectrons vary with chemistry across the specimen surface, and the low energy electrons (commonly known as "secondary electrons") vary with topography as well. The photoelectron spectrum provides information on the surface at a selected pixel area or across the rastered

array of areas. There also may be Auger electrons which, for the present purpose, are included in the term "photoelectrons" as they are caused by the x-rays.

Also Column 7, line 1-12,which states; The x-rays from the scanning anode spot are focused, advantageously by a concave Bragg crystal monochromator, in an energy band of x-rays as an x-ray spot on a pixel area scanning correspondingly over the specimen surface. Photoelectrons are thereby emitted from the scanning pixel area with electron energies characteristic of chemical species at the pixel area. An analyzer means is receptive of photoelectrons from the scanning pixel area for analyzing the electron energies. The analyzer means includes a detector receptive of the photoelectrons for generating corresponding photoelectron signals. A processing means receptive of the signals is cooperative with the rastering means and the analyzer means for generating specimen information representative of the electron energies and thereby chemical species of the specimen surface.

As well as, Column 9, line 29-40, which states; In another embodiment of the invention the instrument 10 includes a second detector 88 that is receptive of photoelectrons 90 directly from the specimen, specifically the low energy "secondary" elections of about up to 10 ev, without filtering by an analyzer. This detector then generates corresponding photoelectron signals. A further portion 94 of the processor 76 receives these signals via line 92 and is cooperative with the rastering means 28,30 to produce a secondary electron image of the surface and display it on the monitor 78. Like a monochrome photograph, the information content is mostly topographical.

And Column 12, line 1-13, which states; The scanning x-ray embodiment for topographical imaging or chemical mapping, or for summing of chemical information over the surface, is advantageous for specimens of electrically insulating material because the primary beam is neutral. Photoemission will cause the sample to charge positively and impede further emission, but this positive charging is readily neutralized by flooding the specimen with a with low energy electrons 100 (generally 1-10 eV and 0.1-10 μA) from a flood gun 98 such as a Perkin-Elmer model 04-090 electron gun or the like. The low energy electrons will not be detected through an analyzer for chemical mapping.

The examiner has interpreted from the Larson (242) references above that beams of both electrons and photons are incident upon a sample, which cause electrons to be both emitted and reflected from the sample concurrently, and that the energy of these emitted and reflected electrons determines whether they are classified as reflected electrons, photoelectrons, or secondary electrons. In addition the filtering means of Larson (242) includes an energy discriminating device that can be configured to selectively detect or reject reflected electrons, photoelectrons, or secondary electrons, as recited in claims 48,61, and 66.

The applicant is also respectfully directed to Nishimura (781), Column 18, line 8-22, which states; In case the UV light source 31 has a constant light emitting period (fu), as in the case of using an a.c. excimer lamp or excimer laser for example, the filtering processing circuit 2764 of the preprocessing circuit 276 uses a notch filter 2764a to cut off the emission frequency (fu) as shown in FIG. 21, or the filtering

processing circuit 2764 uses a filter circuit 2764b including a Fourier transform circuit 2764ba, filtering circuit 2764bb, and inverse Fourier transform circuit 2764bc as shown in FIG. 22 to cut off the emission frequency (fu). In consequence, an electron image which is rid of the influence of photoelectrons created by the UV light irradiation and rid of charge-up can be obtained by the preprocessing circuit 276, while using intact the UV light of continuous emission at the constant frequency by the UV light source 31.

The examiner has interpreted from the Nishimura (781) reference above, that during the dual beam (electron and photon) exposure of a sample, rejection of photoelectrons, is clearly performed by Nishimura (781) using an electronic filtering apparatus and method.

It should also be pointed out that only dependent claim 49 contains a limitation for concurrently exposing a substrate to photons and electrons.

Argument 2.

Applicant states that "In addition claim 53 requires that said filtering is achieved by selecting said photoelectrons based on their angular distribution from said surface of said substrate." Per claim 53, the photoelectrons and reflected electrons leave the surface at different angles (for example, see FIG. 5 and related text in the original specification) so that the filtering may be done based on the angular distribution from the surface.

Moreover, claim 54 depends from claim 53 and adds the further limitation that "said filtering rejects most or all reflected electrons which are rejected at or near a specular angle and selects most or all reflected electrons which are scattered away

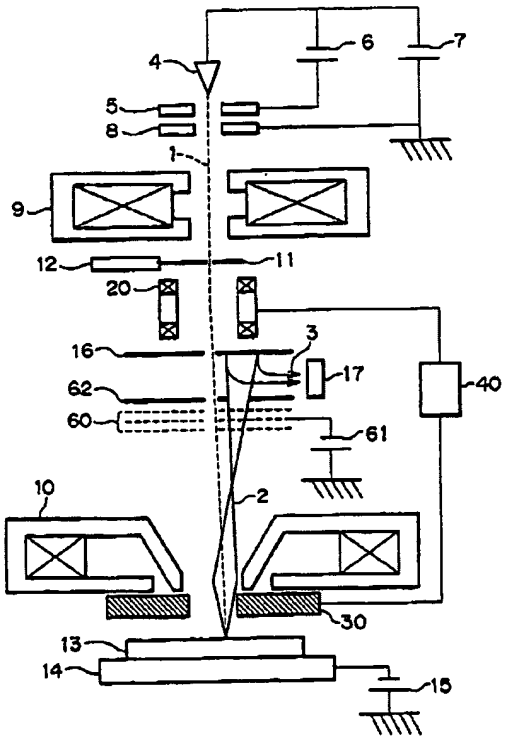
from the specular angle." In some embodiments of the inventions the incident electron beam comes at the surface at a non-perpendicular angle and causes reflected electrons at the specular angle (the angle that is equal and opposite to the incident angle) and scattered away from the specular angle. Per claim 54, only the rejected electrons scattered away from the specular angle are selected. None of the cited references discloses or suggests this additional limitation."

The applicant is directed to applicants specification page 12, line 28-34; and page 13, line 1-4, which states; This fifth component can consist of a filter which selects photoelectrons and rejects reflected electrons based on their angular distribution. FIG. 8 shows one specific example of such a filter 801, a blocking means containing a shaped aperture 802. Both photoelectrons and reflected electrons can leave the surface over a wide range of angles. However, their distribution peaks at different angles. Photoelectrons have the peak of their distribution at an angle normal to the substrate. Reflected electrons have the peak of their distribution at an angle of reflection, which equals the angle of incidence. If we select an angle of incidence for the electron beam, which is far enough from the normal, then the filter can select photoelectrons 803 and reject reflected electrons 804 based on their angular distribution.

The applicant is also respectfully directed to Ose (357), Figure 1 below and paragraph [0032], which states; When there is not any retarding electric field or the retarding electric field is sufficiently small, only the reflected electrons pass the electron beam passing aperture of the objective 10. The reflected electrons have high

energy. Positions at which the reflected electrons fall on the conversion electrode 16 are dependent on angle at which the electrons are reflected by the specimen 13 and energy of the reflected electrons. Therefore, information represented by the selected reflected electrons can be obtained in a high sensitivity by disposing an aperture filter 62 below the conversion electrode 16 with respect to the traveling direction of the primary electron beam. When the reflected electrons reflected in a substantially perpendicular direction are selected, an image of high contrast of a specimen having a specific atomic number can be observed in a high resolution. In the conventional SEM, the path of the reflected electrons and the path of the primary electrons overlap each other and hence the detection of the reflected electrons is difficult.

FIG.1



The examiner has interpreted from the applicants specification and the Ose (357) reference and Figure 1 above, that selection of reflected electrons scattered away from the specular angle, is clearly performed by Ose (357) using the aperture filter 62 and the conversion electrode 16.

Argument 3.

Applicant states that "Claim 55 recites a patentably distinct method that is limited to imaging both reflected electrons and emitted photoelectrons at the same time, while also maintaining surface charge. Nishimura et al. and Ose et al. disclose imaging with secondary or reflected electrons only. Larson et al. discloses imaging with photoelectrons only. None of the references discloses imaging with both reflected and emitted photoelectrons at the same time."

The applicant is respectfully directed to Nishimura (781),Column 15, line 26-32, which states; However, the irradiation of UV light 39 of 150 nm or less to the above-mentioned insulation films will create photoelectrons, which will be detected as a noise component by the electron detector 14. On this account, a UV irradiation controller 32 is used so that the UV light 39 (39'), which irradiates the same view field as of the electron beam, does not interfere with the electron beam.

The examiner has interpreted from the Nishimura (781) reference above, that during the dual beam (electron and photon) exposure of a sample, both photoelectrons and reflected electrons are detected, and imaging is performed, as recited in Claim 55.

However, it should be pointed out that claim 55 language requires that both photoelectrons and reflected electrons be detected, but does not specify that both photoelectrons and reflected electrons are contained in the resultant image, nor does the claim language include the phrase "at the same time" as indicated in the applicants argument above.

Conclusion

5. The Amendment filed on 3-22-2004 under 37 CFR 1.131 has been considered but is ineffective to overcome the Nishimura (781), Larson (242) and Ose (357) references.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ
April 21, 2004

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800